**UC and Princeton Collaborate to Spur “Knovation”**

By: Ashley Duvelius

UC’s College of Education, Criminal Justice, and Human Services; College of Engineering and Applied Science; Princeton Community Middle School; and Knovation, Inc. have partnered to bring students “Knovation,” an elective course that’s teaching Princeton students to think creatively in order to spur innovation.

From left to right: Mr. Antoline, Sophia Spiegel, Maddy McCall, and Principal Durham.

UC’s College of Education, Criminal Justice, and Human Services; College of Engineering and Applied Science; Princeton Community Middle School; and Knovation, Inc. have partnered to bring students “Knovation,” an elective course that’s teaching Princeton students to think creatively in order to spur innovation. The project-based course, taught by science and social studies teachers, is available to students during all three years at Princeton Community Middle School and it allows them to participate in 21st century STEM (science, technology, engineering, and mathematics) experiences.

In 2011, the College of Education, Criminal Justice, and Human Services (CECH) partnered with Princeton to create the Knovation course. Carla Johnson, EdD and CECH associate professor, worked with a team of teachers to brainstorm and vet the curriculum that she’d developed for the course. The Knovation course was named in honor of an existing partnership CECH had with
Randy Wilhelm and his locally-based company, Knovation, Inc. Wilhelm serves as CEO and his company, located in Blue Ash, provides customers with educational technology solutions that are designed with a learner-centered approach to create the most effective, engaging experience every day for every learner.

Also key to this partnership was Johnson’s guidance in professional development to bring Princeton teachers up to speed on implementing the class and she has continually given assistance to make necessary modifications to the course and/or teaching methods specific to STEM.

For the class, students are presented with a project and are challenged to be innovative in its completion. Marni Durham, Principal of the Princeton Community Middle School, explains the objectives of the course, “The first lesson is to understand that we are all innovators in different ways. The second lesson is that the greatest creations come from those of us that are not afraid to fail…and fail a lot to reach a goal. Feeling safe to fail, get back up and try again is a life skill that yields resiliency. The students are also taught to collaborate efficiently in groups, which is how most real-world scenarios are solved.”

Recently, in the class’ “Gauntlet” competition, students were tasked with creating a product that doesn’t exist yet or improving an already existing product. The most realistic project won the event, which was the “Savory Server,” created by eighth graders, Maddy McCall and Sophia Spiegel. Their Savory Server combines a child’s drink cup with a snack cup, making snack time and outings easier on the parents and more satisfying to the kids.

In turn, Johnson reached out to the College of Engineering and Applied Science’s (CEAS) Sam Antoline, School of Dynamic Systems (SDS) adjunct faculty member and head of the CEAS Rapid Prototyping Lab, to have him create a prototype of Maddy and Sophia’s innovation. CECH and Johnson worked with the CEAS Rapid Prototyping Lab team, which included Antoline and Antoline’s student worker, Ryan Slattery, a mechanical engineering technology (MET) senior at the time, to produce the refined 3-D prototype.

The CEAS Rapid Prototyping Lab, located on UC’s Victory Parkway Campus, specializes in the creation of physical objects through a subset of additive manufacturing technology called 3-D printing. Antoline and Slattery took the dimensions of the girls’ prototype, brainstormed multiple
potential designs that had the desired features, and created solid models of these options in the “SolidWorks” computer program. Once the final design was chosen, these models were transferred to the “CatalystEx” software as STL (stereolithography) files. Finally, these STL files were sent to the 3-D printing machine, a Dimension 1200es Series, which produced solid, physical prototypes of each of the components required in the final design.

Johnson then arranged for the girls, along with Principal Durham, to visit the CEAS Rapid Prototyping Lab and pick up their real-world prototype from Antoline and Slattery. Both excitement and satisfaction could be seen on their faces. Sophia said, “In this class, we are always challenged. For example, we did a post-it-note project that was difficult but fun! It is so cool to see something that we worked extremely hard on come to life.”

Slattery adds, “I’m glad to see that the Knovation course gives young students a new-line of thinking and really excites them to think outside of the box. The most important aspect of the class is how it shows students that trial and error are an integral part of engineering and thus, innovation. Credit for the Savory Server prototype is all owed to Sophia and Maddy, I merely tweaked the design dimensions and processed it.”

Principal Durham reflects, “UC and Knovation have been fantastic partners to our school. Both are so supportive of our students and truly encourage innovation. I am so pleased that this opportunity is available to our students. And the students are really enjoying the course as they are challenged in new and exciting ways. The prototype of the Savory Server was a huge hit—Maddy and Sophia are currently researching a patent!”

Students like Maddy and Sophia are the future of STEM and both CECH and CEAS salute their innovation.